

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Atty. Docket No: 3914-3

In re patent application of

IUCHI, SATOSHI et al.

Serial No. 09/758,269

Filed: January 12, 2001



For: TRANSGENIC PLANTS CARRYING NEOXANTHIN CLEAVAGE ENZYME GENE

STATEMENT TO SUPPORT FILING AND SUBMISSION IN
ACCORDANCE WITH 37 C.F.R. §§ 1.821-1.825

Assistant Commissioner for Patents
Washington, D.C. 20231

Box SEQUENCE

Sir:

In connection with a Sequence Listing submitted concurrently herewith, the undersigned hereby states that:

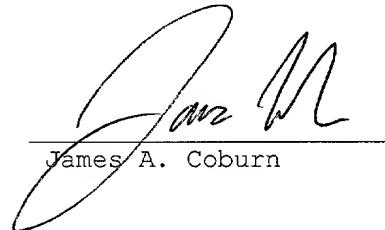
1. the submission, filed herewith in accordance with 37 C.F.R. § 1.821(g), does not include new matter;

2. the content of the attached paper copy and the attached computer readable copy of the Sequence Listing, submitted in accordance with 37 C.F.R. § 1.821(c) and (e), respectively, are the same; and

3. all statements made herein of their own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United

States Code and that such willful false statements may jeopardize the validity of the application or any patent resulting therefrom.

Respectfully submitted,



The image shows a handwritten signature in black ink, appearing to read "James A. Coburn". It is written in a cursive style with a large, flowing "J" at the beginning.

James A. Coburn

June 25, 2001
Date

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1500A Lafayette Road
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Portsmouth, N.H.
800-318-3021

2



SEQUENCE LISTING

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KOBAYASHI, MASATOMO
SHINOZAKI, KAZUO

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ccg atc atc tcc aac gaa gatcaa caa gtc aac ctc gaa gca ggg atg Pro Ile Ile Ser Asn Glu Asp Gln Gln Val Asn Leu Glu Ala Gly Met 465 470 475 480	1440
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Asn Val Ser Ser Ala Leu His Thr Pro Pro Ala Leu His Phe Pro Lys
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Pro Val Asn Glu Gln Pro Val Arg Arg Asn Leu Pro Val Val Gly Lys
 130 135 140

Leu Pro Asp Ser Ile Lys Gly Val Tyr Val Arg Asn Gly Ala Asn Pro
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Leu His Glu Pro Val Thr Gly His His Phe Phe Asp Gly Asp Gly Met
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Val His Ala Val Lys Phe Glu His Gly Ser Ala Ser Tyr Ala Cys Arg
 180 185 190

Phe Thr Gln Thr Asn Arg Phe Val Gln Glu Arg Gln Leu Gly Arg Pro
 195 200 205

Val Phe Pro Lys Ala Ile Gly Glu Leu His Gly His Thr Gly Ile Ala
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Arg Leu Met Leu Phe Tyr Ala Arg Ala Ala Gly Ile Val Asp Pro
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 245 250 255
 Arg Leu Leu Ala Met Ser Glu Asp Asp Leu Pro Tyr Gln Val Gln Ile
 260 265 270
 Thr Pro Asn Gly Asp Leu Lys Thr Val Gly Arg Phe Asp Phe Asp Gly
 275 280 285
 Gln Leu Glu Ser Thr Met Ile Ala His Pro Lys Val Asp Pro Glu Ser
 290 295 300
 Gly Glu Leu Phe Ala Leu Ser Tyr Asp Val Val Ser Lys Pro Tyr Leu
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 Lys Tyr Phe Arg Phe Ser Pro Asp Gly Thr Lys Ser Pro Asp Val Glu
 325 330 335
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 385 390 395 400
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Tyr Ile Leu Cys Phe Val His Asp Glu Lys Thr Trp Lys Ser Glu Leu
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ctt	gtt	gtc	aag	ctc	atg	cac	gat	gct	tct	ctc	cct	ctc	cac	tac	ctc	144
Leu	Val	Val	Lys	Leu	Met	His	Asp	Ala	Ser	Leu	Pro	Leu	His	Tyr	Leu	
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tca	ggc	aac	ttc	gct	ccc	atc	cgt	gat	gaa	act	cct	ccc	gtc	aag	gat	192
Ser	Gly	Asn	Phe	Ala	Pro	Ile	Arg	Asp	Glu	Thr	Pro	Pro	Val	Lys	Asp	
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ctc	ccc	gtc	cat	gga	ttt	ctt	ccc	gaa	tgc	ttg	aat	ggt	gaa	ttt	gtg	240
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Arg	Val	Gly	Pro	Asn	Pro	Lys	Phe	Asp	Ala	Val	Ala	Gly	Tyr	His	Trp	
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Phe	Asp	Gly	Asp	Gly	Met	Ile	His	Gly	Val	Arg	Ile	Lys	Asp	Gly	Lys	
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Ser Gly Asn Phe Ala Pro Ile Arg Asp Glu Thr Pro Pro Val Lys Asp
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Leu Pro Val His Gly Phe Leu Pro Glu Cys Leu Asn Gly Glu Phe Val
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Arg Val Gly Pro Asn Pro Lys Phe Asp Ala Val Ala Gly Tyr His Trp
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Phe Asp Gly Asp Gly Met Ile His Gly Val Arg Ile Lys Asp Gly Lys
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Ala Thr Tyr Val Ser Arg Tyr Val Lys Thr Ser Arg Leu Lys Gln Glu
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Glu Phe Phe Gly Ala Ala Lys Phe Met Lys Ile Gly Asp Leu Lys Gly
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Phe Phe Gly Leu Leu Met Val Asn Val Gln Gln Leu Arg Thr Lys Leu
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Lys Ile Leu Asp Asn Thr Tyr Gly Asn Gly Thr Ala Asn Thr Ala Leu
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Val Tyr His His Gly Lys Leu Leu Ala Leu Gln Glu Ala Asp Lys Pro
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Tyr Val Ile Lys Val Leu Glu Asp Gly Asp Leu Gln Thr Leu Gly Ile
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Ile Asp Tyr Asp Lys Arg Leu Thr His Ser Phe Thr Ala His Pro Lys
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Val Asp Pro Val Thr Gly Glu Met Phe Thr Phe Gly Tyr Ser His Thr
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Pro Pro Tyr Leu Thr Tyr Arg Val Ile Ser Lys Asp Gly Ile Met His
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Asp Pro Val Pro Ile Thr Ile Ser Glu Pro Ile Met Met His Asp Phe
 260 265 270

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Arg Pro Lys Glu Met Val Lys Glu Lys Lys Met Ile Tyr Ser Phe Asp
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Pro Thr Lys Lys Ala Arg Phe Gly Val Leu Pro Arg Tyr Ala Lys Asp
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 Lys Thr Gly Ser Ala Ser Gln Lys Lys Leu Ser Ala Ser Ala Val Asp
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165 170 175	
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ccg gag gga gaa gga gaa gac aaa ggt tat gta atg ggg ttt gtg Pro Glu Gly Glu Gly Glu Asp Lys Gly Tyr Val Met Gly Phe Val 515 520 525	1584
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ggt ttc cat gga acg ttc gtg agc gag aat cag ttg aag gaa caa gtt Gly Phe His Gly Thr Phe Val Ser Glu Asn Gln Leu Lys Glu Gln Val 565 570 575	1728
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Pro Val Pro Ser Pro Val Lys Leu Lys Pro Thr Tyr Pro Asn Leu Asn 50 55 60
Leu Leu Gln Lys Leu Ala Ala Thr Met Leu Asp Lys Ile Glu Ser Ser 65 70 75 80
Ile Val Ile Pro Met Glu Gln Asn Arg Pro Leu Pro Lys Pro Thr Asp 85 90 95
Pro Ala Val Gln Leu Ser Gly Asn Phe Ala Pro Val Asn Glu Cys Pro 100 105 110

Val Gln Asn Gly Leu Glu Val Val Gly Gln Ile Pro Ser Cys Leu Lys
 115 120 125
 Gly Val Tyr Ile Arg Asn Gly Ala Asn Pro Met Phe Pro Pro Leu Ala
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 Gly His His Leu Phe Asp Gly Asp Gly Met Ile His Ala Val Ser Ile
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 Gly Phe Asp Asn Gln Val Ser Tyr Ser Cys Arg Tyr Thr Lys Thr Asn
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 Arg Leu Val Gln Glu Thr Ala Leu Gly Arg Ser Val Phe Pro Lys Pro
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 Ile Gly Glu Leu His Gly His Ser Gly Leu Ala Arg Leu Ala Leu Phe
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 Thr Ala Arg Ala Gly Ile Gly Leu Val Asp Gly Thr Arg Gly Met Gly
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 Val Ala Asn Ala Gly Val Val Phe Phe Asn Gly Arg Leu Leu Ala Met
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 Ser Glu Asp Asp Leu Pro Tyr Gln Val Lys Ile Asp Gly Gln Gly Asp
 245 250 255
 Leu Glu Thr Ile Gly Arg Phe Gly Phe Asp Asp Gln Ile Asp Ser Ser
 260 265 270
 Val Ile Ala His Pro Lys Val Asp Ala Thr Thr Gly Asp Leu His Thr
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 Leu Ser Tyr Asn Val Leu Lys Lys Pro His Leu Arg Tyr Leu Lys Phe
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 Asn Thr Cys Gly Lys Lys Thr Arg Asp Val Glu Ile Thr Leu Pro Glu
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 Pro Thr Met Ile His Asp Phe Ala Ile Thr Glu Asn Phe Val Val Ile
 325 330 335
 Pro Asp Gln Gln Met Val Phe Lys Leu Ser Glu Met Ile Arg Gly Gly
 340 345 350
 Ser Pro Val Ile Tyr Val Lys Glu Lys Met Ala Arg Phe Gly Val Leu
 355 360 365
 Ser Lys Gln Asp Leu Thr Gly Ser Asp Ile Asn Trp Val Asp Val Pro
 370 375 380
 Asp Cys Phe Cys Phe His Leu Trp Asn Ala Trp Glu Glu Arg Thr Glu
 385 390 395 400
 Glu Gly Asp Pro Val Ile Val Val Ile Gly Ser Cys Met Ser Pro Pro
 405 410 415

Asp Thr Ile Phe Ser Glu Ser Gly Glu Pro Thr Arg Val Glu Leu Ser
420 425 430

Glu Ile Arg Leu Asn Met Arg Thr Lys Glu Ser Asn Arg Lys Val Ile
435 440 445

Val Thr Gly Val Asn Leu Glu Ala Gly His Ile Asn Arg Ser Tyr Val
450 455 460

Gly Arg Lys Ser Gln Phe Val Tyr Ile Ala Ile Ala Asp Pro Trp Pro
465 470 475 480

Lys Cys Ser Gly Ile Ala Lys Val Asp Ile Gln Asn Gly Thr Val Ser
485 490 495

Glu Phe Asn Tyr Gly Pro Ser Arg Phe Gly Gly Glu Pro Cys Phe Val
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Pro Glu Gly Glu Gly Glu Asp Lys Gly Tyr Val Met Gly Phe Val
515 520 525

Arg Asp Glu Glu Lys Asp Glu Ser Glu Phe Val Val Val Asp Ala Thr
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Asp Met Lys Gln Val Ala Ala Val Arg Leu Pro Glu Arg Val Pro Tyr
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Phe

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ccc ccc ttc aaa gac cta cct tcc aca tct tct ccc aca aac tta ctt      96
Pro Pro Phe Lys Asp Leu Pro Ser Thr Ser Ser Pro Thr Asn Leu Leu
          20           25           30

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cct tta agg aaa aca tcc tct tcc aac acc atc aca tgt tcc ctt caa      144
Pro Leu Arg Lys Thr Ser Ser Asn Thr Ile Thr Cys Ser Leu Gln
          35           40           45

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aca ctc cac ttc ccc aaa cag tac caa cca aca tcc aca tcc aca tcc      192
Thr Leu His Phe Pro Lys Gln Tyr Gln Pro Thr Ser Thr Ser Thr Ser
      50          55          60

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aca gcc acc acc aca aca ccc acc cca atc aaa act acc acc atc acc		240
Thr Ala Thr Thr Thr Pro Thr Pro Ile Lys Thr Thr Thr Ile Thr		
65	70	75
		80
acc acc aca ccg ccc agg gaa acc aac cct ctc tct gac acc aac caa		288
Thr Thr Thr Pro Pro Arg Glu Thr Asn Pro Leu Ser Asp Thr Asn Gln		
85	90	95
cca tta cct caa aaa tgg aac ttt ctc cag aaa gcc gct gcc acg gcc		336
Pro Leu Pro Gln Lys Trp Asn Phe Leu Gln Lys Ala Ala Ala Thr Ala		
100	105	110
ttg gac ctg gtc gaa acg gcg ctc gtc tcg cac gag cgc aaa cac ccg		384
Leu Asp Leu Val Glu Thr Ala Leu Val Ser His Glu Arg Lys His Pro		
115	120	125
ctc ccc aaa acg gcg gac ccg agg gtc caa atc gcc ggg aac ttc gcg		432
Leu Pro Lys Thr Ala Asp Pro Arg Val Gln Ile Ala Gly Asn Phe Ala		
130	135	140
ccg gtg ccg gag cat gcc gcg gat caa gga ctc ccg gtg gtc gga aaa		480
Pro Val Pro Glu His Ala Ala Asp Gln Gly Leu Pro Val Val Gly Lys		
145	150	155
		160
atc ccc aaa tgc att gac ggc gtg tac gtg cgc aac ggt gcc aat ccg		528
Ile Pro Lys Cys Ile Asp Gly Val Tyr Val Arg Asn Gly Ala Asn Pro		
165	170	175
ctc tac gag cct gtg gcc ggg cac cac ttc ttc gac ggc gac ggc atg		576
Leu Tyr Glu Pro Val Ala Gly His His Phe Phe Asp Gly Asp Gly Met		
180	185	190
gtc cac gcc gtg aag ttc acg aac ggc gcc gcc agc tac gcc tgc cgc		624
Val His Ala Val Lys Phe Thr Asn Gly Ala Ala Ser Tyr Ala Cys Arg		
195	200	205
ttc acc gag acg cag cgt ctc tcg cag gag aaa tct cta ggc cgc ccg		672
Phe Thr Glu Thr Gln Arg Leu Ser Gln Glu Lys Ser Leu Gly Arg Pro		
210	215	220
gtg ttc ccg aag gcc atc ggg gag ctc cac ggc cac tcc ggc atc gcg		720
Val Phe Pro Lys Ala Ile Gly Glu Leu His Gly His Ser Gly Ile Ala		
225	230	235
		240
cgg ctc ctc ttc tac gcg cgc ggt ctc ttc ggg ctc gtt gat ggg		768
Arg Leu Leu Leu Phe Tyr Ala Arg Gly Leu Phe Gly Leu Val Asp Gly		
245	250	255
tcc cag ggc atg ggc gtg gcg aac gcc ggt ctc gtc tac ttc aac aac		816
Ser Gln Gly Met Gly Val Ala Asn Ala Gly Leu Val Tyr Phe Asn Asn		
260	265	270
cac ctc ttg gcc atg tcc gaa gac gat tta ccc tac cac gtg aga atc		864
His Leu Leu Ala Met Ser Glu Asp Asp Leu Pro Tyr His Val Arg Ile		
275	280	285

acc cct aac ggc gac tta acc acc gtt ggc cgt tac gac ttc aac ggg Thr Pro Asn Gly Asp Leu Thr Thr Val Gly Arg Tyr Asp Phe Asn Gly	912
290 295 300	
cag ctc aac tca aca atg atc gcc cac ccg aaa ctg gac ccc gtc gac Gln Leu Asn Ser Thr Met Ile Ala His Pro Lys Leu Asp Pro Val Asp	960
305 310 315 320	
ggc gac ctc cac gcg ctc agc tac gac gtc att cag aag cct tac ctc Gly Asp Leu His Ala Leu Ser Tyr Asp Val Ile Gln Lys Pro Tyr Leu	1008
325 330 335	
aag tac ttc cgt ttc tcc ccc gac ggc gtc aag tcc ccc gac gtg gaa Lys Tyr Phe Arg Phe Ser Pro Asp Gly Val Lys Ser Pro Asp Val Glu	1056
340 345 350	
atc ccc ctg aag gag ccc acc atg atg cac gat ttc gcc ata acg gag Ile Pro Leu Lys Glu Pro Thr Met Met His Asp Phe Ala Ile Thr Glu	1104
355 360 365	
aat ttc gtc gtc gtc ccc gac cag cag gtg gtc ttc aaa cta acg gag Asn Phe Val Val Val Pro Asp Gln Gln Val Val Phe Lys Leu Thr Glu	1152
370 375 380	
atg atc acc ggc ggg tcc ccc gtg gtc tac gac aag aac aaa acc tca Met Ile Thr Gly Gly Ser Pro Val Val Tyr Asp Lys Asn Lys Thr Ser	1200
385 390 395 400	
cgg ttt ggg att ctg cac aag aat gcg aag gac gcg aat gcg atg cgg Arg Phe Gly Ile Leu His Lys Asn Ala Lys Asp Ala Asn Ala Met Arg	1248
405 410 415	
tgg atc gac gcg ccg gat tgt ttc tgc ttc cac ctc tgg aac gcg tgg Trp Ile Asp Ala Pro Asp Cys Phe His Leu Trp Asn Ala Trp	1296
420 425 430	
gag gag ccc gaa acc gag gag gtt gtg gtg att ggg tcc tgc atg acc Glu Glu Pro Glu Thr Glu Glu Val Val Val Ile Gly Ser Cys Met Thr	1344
435 440 445	
cct gcg gac tcc att ttc aac gaa tgc gag gag agt ttg aag agc gtg Pro Ala Asp Ser Ile Phe Asn Glu Cys Glu Ser Leu Lys Ser Val	1392
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ctg tca gag ata agg ctg aac ttg agg acc ggc aag tcc act cgg cgc Leu Ser Glu Ile Arg Leu Asn Leu Arg Thr Gly Lys Ser Thr Arg Arg	1440
465 470 475 480	
ccc att atc tcc gac gcc gaa caa gtg aac ctg gaa gcc ggc atg gtg Pro Ile Ile Ser Asp Ala Glu Gln Val Asn Leu Glu Ala Gly Met Val	1488
485 490 495	
aac aga aac aag ctc gga agg aag acc cag ttc gcg tat ctg gct ctg Asn Arg Asn Lys Leu Gly Arg Lys Thr Gln Phe Ala Tyr Leu Ala Leu	1536
500 505 510	

gcg gag ccc tgg ccc aaa gtc tcg ggc ttt gcg aaa gtt gat ttg ctg Ala Glu Pro Trp Pro Lys Val Ser Gly Phe Ala Lys Val Asp Leu Leu 515 520 525	1584
agt ggg gaa gtg aag aag tac atg tat gga gaa gag aag ttc ggt ggg Ser Gly Glu Val Lys Lys Tyr Met Tyr Gly Glu Lys Phe Gly Gly 530 535 540	1632
gag cct ctg ttt ctt ccc aac ggc caa aaa gaa gac gat ggg tat att Glu Pro Leu Phe Leu Pro Asn Gly Gln Lys Glu Asp Asp Gly Tyr Ile 545 550 555 560	1680
ctg gca ttc gtg cac gac gag aaa gaa tgg aaa tcc gag ctg cag att Leu Ala Phe Val His Asp Glu Lys Glu Trp Lys Ser Glu Leu Gln Ile 565 570 575	1728
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cgt gtt ccc tac ggt ttt cat gga act ttc att cat tcc aag gat ttg Arg Val Pro Tyr Gly Phe His Gly Thr Phe Ile His Ser Lys Asp Leu 595 600 605	1824
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Pro Leu Arg Lys Thr Ser Ser Asn Thr Ile Thr Cys Ser Leu Gln 35 40 45	
Thr Leu His Phe Pro Lys Gln Tyr Gln Pro Thr Ser Thr Ser Thr Ser 50 55 60	
Thr Ala Thr Thr Thr Pro Thr Pro Ile Lys Thr Thr Thr Ile Thr 65 70 75 80	
Thr Thr Thr Pro Pro Arg Glu Thr Asn Pro Leu Ser Asp Thr Asn Gln 85 90 95	
Pro Leu Pro Gln Lys Trp Asn Phe Leu Gln Lys Ala Ala Ala Thr Ala 100 105 110	
Leu Asp Leu Val Glu Thr Ala Leu Val Ser His Glu Arg Lys His Pro 115 120 125	

Leu Pro Lys Thr Ala Asp Pro Arg Val Gln Ile Ala Gly Asn Phe Ala
 130 135 140
 Pro Val Pro Glu His Ala Ala Asp Gln Gly Leu Pro Val Val Gly Lys
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 Ile Pro Lys Cys Ile Asp Gly Val Tyr Val Arg Asn Gly Ala Asn Pro
 165 170 175
 Leu Tyr Glu Pro Val Ala Gly His His Phe Phe Asp Gly Asp Gly Met
 180 185 190
 Val His Ala Val Lys Phe Thr Asn Gly Ala Ala Ser Tyr Ala Cys Arg
 195 200 205
 Phe Thr Glu Thr Gln Arg Leu Ser Gln Glu Lys Ser Leu Gly Arg Pro
 210 215 220
 Val Phe Pro Lys Ala Ile Gly Glu Leu His Gly His Ser Gly Ile Ala
 225 230 235 240
 Arg Leu Leu Leu Phe Tyr Ala Arg Gly Leu Phe Gly Leu Val Asp Gly
 245 250 255
 Ser Gln Gly Met Gly Val Ala Asn Ala Gly Leu Val Tyr Phe Asn Asn
 260 265 270
 His Leu Leu Ala Met Ser Glu Asp Asp Leu Pro Tyr His Val Arg Ile
 275 280 285
 Thr Pro Asn Gly Asp Leu Thr Thr Val Gly Arg Tyr Asp Phe Asn Gly
 290 295 300
 Gln Leu Asn Ser Thr Met Ile Ala His Pro Lys Leu Asp Pro Val Asp
 305 310 315 320
 Gly Asp Leu His Ala Leu Ser Tyr Asp Val Ile Gln Lys Pro Tyr Leu
 325 330 335
 Lys Tyr Phe Arg Phe Ser Pro Asp Gly Val Lys Ser Pro Asp Val Glu
 340 345 350
 Ile Pro Leu Lys Glu Pro Thr Met Met His Asp Phe Ala Ile Thr Glu
 355 360 365
 Asn Phe Val Val Val Pro Asp Gln Gln Val Val Phe Lys Leu Thr Glu
 370 375 380
 Met Ile Thr Gly Gly Ser Pro Val Val Tyr Asp Lys Asn Lys Thr Ser
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 Arg Phe Gly Ile Leu His Lys Asn Ala Lys Asp Ala Asn Ala Met Arg
 405 410 415
 Trp Ile Asp Ala Pro Asp Cys Phe Cys Phe His Leu Trp Asn Ala Trp
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Glu Glu Pro Glu Thr Glu Glu Val Val Val Ile Gly Ser Cys Met Thr
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Pro Ala Asp Ser Ile Phe Asn Glu Cys Glu Glu Ser Leu Lys Ser Val
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Leu Ser Glu Ile Arg Leu Asn Leu Arg Thr Gly Lys Ser Thr Arg Arg
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Pro Ile Ile Ser Asp Ala Glu Gln Val Asn Leu Glu Ala Gly Met Val
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Asn Arg Asn Lys Leu Gly Arg Lys Thr Gln Phe Ala Tyr Leu Ala Leu
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Ala Glu Pro Trp Pro Lys Val Ser Gly Phe Ala Lys Val Asp Leu Leu
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Ser Gly Glu Val Lys Lys Tyr Met Tyr Gly Glu Glu Lys Phe Gly Gly
 530 535 540

Glu Pro Leu Phe Leu Pro Asn Gly Gln Lys Glu Asp Asp Gly Tyr Ile
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Leu Ala Phe Val His Asp Glu Lys Glu Trp Lys Ser Glu Leu Gln Ile
 565 570 575

Val Asn Ala Gln Asn Leu Lys Leu Glu Ala Ser Ile Lys Leu Pro Ser
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 Pro Ala Arg Ser Arg Ala Arg Ala Ser Asn Ser Val Arg Phe Ser Pro
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cgc gcc gtc agc tcc gtg ccg ccc gcc gag tgc ctc cag cgc ccg ttc 144
 Arg Ala Val Ser Ser Val Pro Pro Ala Glu Cys Leu Gln Ala Pro Phe
 35 40 45

cac aag ccc gtc gcc gac ctg cct gcg ccg tcc agg aag ccc gcc gcc		192	
His Lys Pro Val Ala Asp Leu Pro Ala Pro Ser Arg Lys Pro Ala Ala			
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att gcc gtc cca ggg cac gcc gcg ccg agg aaa gcg gag ggc ggc		240	
Ile Ala Val Pro Gly His Ala Ala Ala Pro Arg Lys Ala Glu Gly Gly			
65	70	75	80
aag aag cag ctc aac ttg ttc cag cgc gcc gcg gcc gcg ctc gac		288	
Lys Lys Gln Leu Asn Leu Phe Gln Arg Ala Ala Ala Ala Ala Leu Asp			
85	90	95	
gcg ttc gag gaa ggg ttc gtg gcc aac gtc ctc gag cgg ccc cac ggg		336	
Ala Phe Glu Glu Gly Phe Val Ala Asn Val Leu Glu Arg Pro His Gly			
100	105	110	
ctg ccc agc acg gcc gac ccg gcc gtg cag atc gcc ggc aac ttc gcg		384	
Leu Pro Ser Thr Ala Asp Pro Ala Val Gln Ile Ala Gly Asn Phe Ala			
115	120	125	
ccc gtc ggg gag agg ccg ccc gtg cac gag ctc ccc gtc tcc ggc cgc		432	
Pro Val Gly Glu Arg Pro Pro Val His Glu Leu Pro Val Ser Gly Arg			
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atc ccg ccc ttc atc gac ggg gtc tac gcg cgc aac ggc aac ccc		480	
Ile Pro Pro Phe Ile Asp Gly Val Tyr Ala Arg Asn Gly Ala Asn Pro			
145	150	155	160
tgc ttc gac ccc gtc gcg ggg cac cac ctc ttc gac ggc gac ggc atg		528	
Cys Phe Asp Pro Val Ala Gly His His Leu Phe Asp Gly Asp Gly Met			
165	170	175	
gtg cac gcg ctg cgg ata cgc aac ggc gcc gcc gag tcc tac gcc tgc		576	
Val His Ala Leu Arg Ile Arg Asn Gly Ala Ala Glu Ser Tyr Ala Cys			
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cgc ttc acg gag acc gcg cgc ctg cgc cag gag cgc gcg atc ggc cgc		624	
Arg Phe Thr Glu Thr Ala Arg Leu Arg Gln Glu Arg Ala Ile Gly Arg			
195	200	205	
ccc gtc ttc ccc aag gcc att ggc gag ctg cac ggg cac tcc ggg atc		672	
Pro Val Phe Pro Lys Ala Ile Gly Glu Leu His Gly His Ser Gly Ile			
210	215	220	
gcg cgc ctc gcc ctg ttc tac gcg cgc gcc gcg tgc ggc ctc gtg gac		720	
Ala Arg Leu Ala Leu Phe Tyr Ala Arg Ala Ala Cys Gly Leu Val Asp			
225	230	235	240
ccc tcg gcc acc ggc gtg gcc aac gcc ggc ctc gtc tac ttc aac		768	
Pro Ser Ala Gly Thr Gly Val Ala Asn Ala Gly Leu Val Tyr Phe Asn			
245	250	255	
ggc cgc ctg ctc gcc atg tcc gag gac gac ctc ccc tac cac gtc cgc		816	
Gly Arg Leu Leu Ala Met Ser Glu Asp Asp Leu Pro Tyr His Val Arg			
260	265	270	

gtg gcg gac gac ggc gac ctc gag acc gtc ggc cgc tac gac ttc gac Val Ala Asp Asp Gly Asp Leu Glu Thr Val Gly Arg Tyr Asp Phe Asp 275 280 285	864
ggg cag ctc ggc tgc gcc atg atc gcg cac ccc aag ctg gac ccg gcc Gly Gln Leu Gly Cys Ala Met Ile Ala His Pro Lys Leu Asp Pro Ala 290 295 300	912
acc ggg gag ctc cac gcg ctc agc tac gac gtc atc aag agg ccg tac Thr Gly Glu Leu His Ala Leu Ser Tyr Asp Val Ile Lys Arg Pro Tyr 305 310 315 320	960
ctc aag tac ttc tac ttc agg ccc gac ggc acc aag tcc gac gac gtg Leu Lys Tyr Phe Tyr Phe Arg Pro Asp Gly Thr Lys Ser Asp Asp Val 325 330 335	1008
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gcg tgg gtg gac gtg ccg gac tgc ttc tgc cac ctg tgg aac gcg Ala Trp Val Asp Val Pro Asp Cys Phe His Leu Trp Asn Ala 405 410 415	1248
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acc ccc gcc gac tcc atc ttc aac gag tcc gac gag cgc ctg gag agc Thr Pro Ala Asp Ser Ile Phe Asn Glu Ser Asp Glu Arg Leu Glu Ser 435 440 445	1344
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gtg gcg gag ccg tgg ccc aag gag tcg ggc ttc gcc aag gag gac ctg Val Ala Glu Pro Trp Pro Lys Glu Ser Gly Phe Ala Lys Glu Asp Leu	500	505	510	1536
tcc acg ggc gag ctc acc aag ttc gag tac ggc gag ggc cgg ttc ggc Ser Thr Gly Glu Leu Thr Lys Phe Glu Tyr Gly Glu Arg Phe Gly	515	520	525	1584
ggc gag ccc tgc ttc gtt ccc atg gac ccg gcc gcg gcc cac ccg cgc Gly Glu Pro Cys Phe Val Pro Met Asp Pro Ala Ala His Pro Arg	530	535	540	1632
ggc gag gac gac ggg tac gtg ctc acc ttc gtc cac gac gag cgc gcc Gly Glu Asp Asp Gly Tyr Val Leu Thr Phe Val His Asp Glu Arg Ala	545	550	555	1680
ggc acg tcg gag cta ctt gtg gtc aat gcc gcc gac atc cgg ctg gag Gly Thr Ser Glu Leu Leu Val Val Asn Ala Ala Asp Ile Arg Leu Glu	565	570	575	1728
gcc acg gtt cag ctg ccg tcc cgc gtg ccc ttc ggc ttc cac ggc acc Ala Thr Val Gln Leu Pro Ser Arg Val Pro Phe Gly Phe His Gly Thr	580	585	590	1776
ttc atc acg ggc cag gag ctc gag gcc cag gcg gcc tga Phe Ile Thr Gly Gln Glu Leu Ala Gln Ala Ala	595	600		1815
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Met Gln Gly Leu Ala Pro Pro Thr Ser Val Ser Ile His Arg His Leu	1	5	10	15
Pro Ala Arg Ser Arg Ala Arg Ala Ser Asn Ser Val Arg Phe Ser Pro	20	25	30	
Arg Ala Val Ser Ser Val Pro Pro Ala Glu Cys Leu Gln Ala Pro Phe	35	40	45	
His Lys Pro Val Ala Asp Leu Pro Ala Pro Ser Arg Lys Pro Ala Ala	50	55	60	
Ile Ala Val Pro Gly His Ala Ala Ala Pro Arg Lys Ala Glu Gly Gly	65	70	75	80
Lys Lys Gln Leu Asn Leu Phe Gln Arg Ala Ala Ala Ala Leu Asp	85	90	95	
Ala Phe Glu Glu Gly Phe Val Ala Asn Val Leu Glu Arg Pro His Gly	100	105	110	
Leu Pro Ser Thr Ala Asp Pro Ala Val Gln Ile Ala Gly Asn Phe Ala	115	120	125	

Pro Val Gly Glu Arg Pro Pro Val His Glu Leu Pro Val Ser Gly Arg
 130 135 140
 Ile Pro Pro Phe Ile Asp Gly Val Tyr Ala Arg Asn Gly Ala Asn Pro
 145 150 155 160
 Cys Phe Asp Pro Val Ala Gly His His Leu Phe Asp Gly Asp Gly Met
 165 170 175
 Val His Ala Leu Arg Ile Arg Asn Gly Ala Ala Glu Ser Tyr Ala Cys
 180 185 190
 Arg Phe Thr Glu Thr Ala Arg Leu Arg Gln Glu Arg Ala Ile Gly Arg
 195 200 205
 Pro Val Phe Pro Lys Ala Ile Gly Glu Leu His Gly His Ser Gly Ile
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 Ala Arg Leu Ala Leu Phe Tyr Ala Arg Ala Ala Cys Gly Leu Val Asp
 225 230 235 240
 Pro Ser Ala Gly Thr Gly Val Ala Asn Ala Gly Leu Val Tyr Phe Asn
 245 250 255
 Gly Arg Leu Leu Ala Met Ser Glu Asp Asp Leu Pro Tyr His Val Arg
 260 265 270
 Val Ala Asp Asp Gly Asp Leu Glu Thr Val Gly Arg Tyr Asp Phe Asp
 275 280 285
 Gly Gln Leu Gly Cys Ala Met Ile Ala His Pro Lys Leu Asp Pro Ala
 290 295 300
 Thr Gly Glu Leu His Ala Leu Ser Tyr Asp Val Ile Lys Arg Pro Tyr
 305 310 315 320
 Leu Lys Tyr Phe Tyr Phe Arg Pro Asp Gly Thr Lys Ser Asp Asp Val
 325 330 335
 Glu Ile Pro Leu Glu Gln Pro Thr Met Ile His Asp Phe Ala Ile Thr
 340 345 350
 Glu Asn Phe Val Val Pro Asp His Gln Val Val Phe Lys Leu Gln
 355 360 365
 Glu Met Leu Arg Gly Gly Ser Pro Val Val Leu Asp Lys Glu Lys Thr
 370 375 380
 Ser Arg Phe Gly Val Leu Pro Lys His Ala Ala Asp Ala Ser Glu Met
 385 390 395 400
 Ala Trp Val Asp Val Pro Asp Cys Phe Cys Phe His Leu Trp Asn Ala
 405 410 415
 Trp Glu Asp Glu Ala Thr Gly Glu Val Val Val Ile Gly Ser Cys Met
 420 425 430

Thr Pro Ala Asp Ser Ile Phe Asn Glu Ser Asp Glu Arg Leu Glu Ser
 435 440 445

Val Leu Thr Glu Ile Arg Leu Asp Ala Arg Thr Gly Arg Ser Thr Arg
 450 455 460

Arg Ala Val Leu Pro Pro Ser Gln Gln Glu Asn Leu Glu Val Gly Met
 465 470 475 480

Val Asn Arg Asn Leu Leu Gly Arg Glu Ser Arg Tyr Ala Tyr Leu Ala
 485 490 495

Val Ala Glu Pro Trp Pro Lys Glu Ser Gly Phe Ala Lys Glu Asp Leu
 500 505 510

Ser Thr Gly Glu Leu Thr Lys Phe Glu Tyr Gly Glu Gly Arg Phe Gly
 515 520 525

Gly Glu Pro Cys Phe Val Pro Met Asp Pro Ala Ala Ala His Pro Arg
 530 535 540

Gly Glu Asp Asp Gly Tyr Val Leu Thr Phe Val His Asp Glu Arg Ala
 545 550 555 560

Gly Thr Ser Glu Leu Leu Val Val Asn Ala Ala Asp Ile Arg Leu Glu
 565 570 575

Ala Thr Val Gln Leu Pro Ser Arg Val Pro Phe Gly Phe His Gly Thr
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Phe Ile Thr Gly Gln Glu Leu Glu Ala Gln Ala Ala
 595 600

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<211> 1818

<212> DNA

<213> Lycopersicon esculentum

<220>

<221> CDS

<222> (1)..(1815)

<400> 15

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 Met Ala Thr Thr Ser His Ala Thr Asn Thr Trp Ile Lys Thr Lys
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ttg tca atg cca tca tca aag gag ttt ggt ttt gca tca aac tct att 96
 Leu Ser Met Pro Ser Ser Lys Glu Phe Gly Phe Ala Ser Asn Ser Ile
 20 25 30

tct cta ctc aaa aat caa cat aat agg caa agt ctc aac att aat tcc 144
 Ser Leu Leu Lys Asn Gln His Asn Arg Gln Ser Leu Asn Ile Asn Ser
 35 40 45

tct ctt caa gct cca cct ata ctt cat ttt cct aaa caa tct tca aat		192
Ser Leu Gln Ala Pro Pro Ile Leu His Phe Pro Lys Gln Ser Ser Asn		
50 55 60		
tat caa aca cca aag aat aat aca att tca cac cca aaa caa gaa aac		240
Tyr Gln Thr Pro Lys Asn Asn Thr Ile Ser His Pro Lys Gln Glu Asn		
65 70 75 80		
aac aac tcc tct tct tca act tcc aag tgg aat tta gtg cag aaa		288
Asn Asn Ser Ser Ser Ser Thr Ser Lys Trp Asn Leu Val Gln Lys		
85 90 95		
gca gca gca atg gct tta gat gct gta gaa agt gct tta act aaa cat		336
Ala Ala Ala Met Ala Leu Asp Ala Val Glu Ser Ala Leu Thr Lys His		
100 105 110		
gaa ctt gaa cac cct ttg ccg aaa aca gcc gac cca cga gtc cag att		384
Glu Leu Glu His Pro Leu Pro Lys Thr Ala Asp Pro Arg Val Gln Ile		
115 120 125		
tct ggg aat ttt gct ccg gta ccg gaa aat cca gtc tgt caa tct ctt		432
Ser Gly Asn Phe Ala Pro Val Pro Glu Asn Pro Val Cys Gln Ser Leu		
130 135 140		
ccg gtc acc gga aaa ata ccc aaa tgt gtt caa ggc gtt tac gtt cga		480
Pro Val Thr Gly Lys Ile Pro Lys Cys Val Gln Gly Val Tyr Val Arg		
145 150 155 160		
aac gga gct aac cct ctt ttt gaa cca acc gcc gga cac cat ttc ttc		528
Asn Gly Ala Asn Pro Leu Phe Glu Pro Thr Ala Gly His His Phe Phe		
165 170 175		
gac ggc gac ggt atg gtt cac gcc gtt caa ttc aaa aat ggg tcg gct		576
Asp Gly Asp Gly Met Val His Ala Val Gln Phe Lys Asn Gly Ser Ala		
180 185 190		
agt tac gct tgc cgt ttc act gaa aca gag agg ctt gtt caa gaa aaa		624
Ser Tyr Ala Cys Arg Phe Thr Glu Thr Glu Arg Leu Val Gln Glu Lys		
195 200 205		
gct ttg ggt cgc cct gtt ttc cct aaa gcc att ggt gaa tta cat ggt		672
Ala Leu Gly Arg Pro Val Phe Pro Lys Ala Ile Gly Glu Leu His Gly		
210 215 220		
cac tct gga att gca agg ctt atg ctg ttt tac gct cgt ggg ctc ttc		720
His Ser Gly Ile Ala Arg Leu Met Leu Phe Tyr Ala Arg Gly Leu Phe		
225 230 235 240		
gga ctt gtt gat cac agt aaa gga act ggt gtt gca aac gcc ggt tta		768
Gly Leu Val Asp His Ser Lys Gly Thr Gly Val Ala Asn Ala Gly Leu		
245 250 255		
gtc tat ttc aat aac cga tta ctt gct atg tct gaa gat gat ttg cct		816
Val Tyr Phe Asn Asn Arg Leu Leu Ala Met Ser Glu Asp Asp Leu Pro		
260 265 270		

tac cat gta aag gta aca ccc acc ggc gat ctt aaa aca gag ggt cga Tyr His Val Lys Val Thr Pro Thr Gly Asp Leu Lys Thr Glu Gly Arg 275 280 285	864
ttc gat ttc gac ggc cag cta aaa tcc acc atg ata gct cac cca aag Phe Asp Phe Asp Gly Gln Leu Lys Ser Thr Met Ile Ala His Pro Lys 290 295 300	912
ctc gac cca gtt tcc ggt gag cta ttt gct ctt agc tac gat gtg att Leu Asp Pro Val Ser Gly Glu Leu Phe Ala Leu Ser Tyr Asp Val Ile 305 310 315 320	960
cag aag cca tac ctc aag tac ttc aga ttt tca aaa aat ggg gaa aaa Gln Lys Pro Tyr Leu Lys Tyr Phe Arg Phe Ser Lys Asn Gly Glu Lys 325 330 335	1008
tca aat gat gtt gaa att cca gtt gaa gac cca aca atg atg cat gat Ser Asn Asp Val Glu Ile Pro Val Glu Asp Pro Thr Met Met His Asp 340 345 350	1056
ttc gca att act gag aac ttc gtc gtc att cct gat caa caa gtc gtt Phe Ala Ile Thr Glu Asn Phe Val Val Ile Pro Asp Gln Gln Val Val 355 360 365	1104
ttc aag atg tct gaa atg atc cgt gga ggt tca ccg gtg gtt tac gac Phe Lys Met Ser Glu Met Ile Arg Gly Ser Pro Val Val Tyr Asp 370 375 380	1152
aag aac aaa gtt tcc cga ttt ggt att ctg gat aag tac gcg aaa gat Lys Asn Lys Val Ser Arg Phe Gly Ile Leu Asp Lys Tyr Ala Lys Asp 385 390 395 400	1200
ggg tct gat ttg aaa tgg gtt gaa gta cct gat tgt ttc tgt ttc cac Gly Ser Asp Leu Lys Trp Val Glu Val Pro Asp Cys Phe Cys Phe His 405 410 415	1248
ctc tgg aat gct tgg gaa gaa gca gaa aca gat gaa atc gtt gta att Leu Trp Asn Ala Trp Glu Ala Glu Thr Asp Glu Ile Val Val Ile 420 425 430	1296
ggt tca tgt atg aca cca cca gac tcc att ttc aat gaa tgt gat gaa Gly Ser Cys Met Thr Pro Pro Asp Ser Ile Phe Asn Glu Cys Asp Glu 435 440 445	1344
ggg cta aag agt gtt tta tcc gaa atc cgt ctc aat ttg aaa aca ggg Gly Leu Lys Ser Val Leu Ser Glu Ile Arg Leu Asn Leu Lys Thr Gly 450 455 460	1392
aaa tca aca aga aaa tcc ata atc gaa aac ccg gat gaa caa gtg aat Lys Ser Thr Arg Lys Ser Ile Ile Glu Asn Pro Asp Glu Gln Val Asn 465 470 475 480	1440
tta gaa gct gga atg gtg aac cga aac aaa ctc gga agg aaa aca gag Leu Glu Ala Gly Met Val Asn Arg Asn Lys Leu Gly Arg Lys Thr Glu 485 490 495	1488

tat gct tat ttg gct atc gct gaa cca tgg cca aaa gtt tct ggt ttt		1536	
Tyr Ala Tyr Leu Ala Ile Ala Glu Pro Trp Pro Lys Val Ser Gly Phe			
500	505	510	
gca aaa gta aac ctg ttc acc ggt gaa gtt gag aaa ttc att tat ggt		1584	
Ala Lys Val Asn Leu Phe Thr Gly Glu Val Glu Lys Phe Ile Tyr Gly			
515	520	525	
gac aac aaa tat ggt ggg gaa cct ctt ttt tta cca aga gac ccc aac		1632	
Asp Asn Lys Tyr Gly Gly Glu Pro Leu Phe Leu Pro Arg Asp Pro Asn			
530	535	540	
agc aag gaa gaa gac gat ggt tat att tta gct ttc gtt cac gat gag		1680	
Ser Lys Glu Glu Asp Asp Gly Tyr Ile Leu Ala Phe Val His Asp Glu			
545	550	555	560
aaa gaa tgg aaa tca gaa ctg caa att gtt aac gca atg agt ttg aag		1728	
Lys Glu Trp Lys Ser Glu Leu Gln Ile Val Asn Ala Met Ser Leu Lys			
565	570	575	
ttg gag gca act gtg aag ctt cca tca aga gtt cct tat gga ttt cat		1776	
Leu Glu Ala Thr Val Lys Leu Pro Ser Arg Val Pro Tyr Gly Phe His			
580	585	590	
gga aca ttc ata aac gcc aat gat ttg gca aat cag gca tga		1818	
Gly Thr Phe Ile Asn Ala Asn Asp Leu Ala Asn Gln Ala			
595	600	605	
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<211> 605			
<212> PRT			
<213> Lycopersicon esculentum			
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Leu Ser Met Pro Ser Ser Lys Glu Phe Gly Phe Ala Ser Asn Ser Ile			
20	25	30	
Ser Leu Leu Lys Asn Gln His Asn Arg Gln Ser Leu Asn Ile Asn Ser			
35	40	45	
Ser Leu Gln Ala Pro Pro Ile Leu His Phe Pro Lys Gln Ser Ser Asn			
50	55	60	
Tyr Gln Thr Pro Lys Asn Asn Thr Ile Ser His Pro Lys Gln Glu Asn			
65	70	75	80
Asn Asn Ser Ser Ser Ser Thr Ser Lys Trp Asn Leu Val Gln Lys			
85	90	95	
Ala Ala Ala Met Ala Leu Asp Ala Val Glu Ser Ala Leu Thr Lys His			
100	105	110	
Glu Leu Glu His Pro Leu Pro Lys Thr Ala Asp Pro Arg Val Gln Ile			
115	120	125	

Ser Gly Asn Phe Ala Pro Val Pro Glu Asn Pro Val Cys Gln Ser Leu
 130 135 140

Pro Val Thr Gly Lys Ile Pro Lys Cys Val Gln Gly Val Tyr Val Arg
 145 150 155 160

Asn Gly Ala Asn Pro Leu Phe Glu Pro Thr Ala Gly His His Phe Phe
 165 170 175

Asp Gly Asp Gly Met Val His Ala Val Gln Phe Lys Asn Gly Ser Ala
 180 185 190

Ser Tyr Ala Cys Arg Phe Thr Glu Thr Glu Arg Leu Val Gln Glu Lys
 195 200 205

Ala Leu Gly Arg Pro Val Phe Pro Lys Ala Ile Gly Glu Leu His Gly
 210 215 220

His Ser Gly Ile Ala Arg Leu Met Leu Phe Tyr Ala Arg Gly Leu Phe
 225 230 235 240

Gly Leu Val Asp His Ser Lys Gly Thr Gly Val Ala Asn Ala Gly Leu
 245 250 255

Val Tyr Phe Asn Asn Arg Leu Leu Ala Met Ser Glu Asp Asp Leu Pro
 260 265 270

Tyr His Val Lys Val Thr Pro Thr Gly Asp Leu Lys Thr Glu Gly Arg
 275 280 285

Phe Asp Phe Asp Gly Gln Leu Lys Ser Thr Met Ile Ala His Pro Lys
 290 295 300

Leu Asp Pro Val Ser Gly Glu Leu Phe Ala Leu Ser Tyr Asp Val Ile
 305 310 315 320

Gln Lys Pro Tyr Leu Lys Tyr Phe Arg Phe Ser Lys Asn Gly Glu Lys
 325 330 335

Ser Asn Asp Val Glu Ile Pro Val Glu Asp Pro Thr Met Met His Asp
 340 345 350

Phe Ala Ile Thr Glu Asn Phe Val Val Ile Pro Asp Gln Gln Val Val
 355 360 365

Phe Lys Met Ser Glu Met Ile Arg Gly Gly Ser Pro Val Val Tyr Asp
 370 375 380

Lys Asn Lys Val Ser Arg Phe Gly Ile Leu Asp Lys Tyr Ala Lys Asp
 385 390 395 400

Gly Ser Asp Leu Lys Trp Val Glu Val Pro Asp Cys Phe Cys Phe His
 405 410 415

Leu Trp Asn Ala Trp Glu Glu Ala Glu Thr Asp Glu Ile Val Val Ile
 420 425 430

Gly Ser Cys Met Thr Pro Pro Asp Ser Ile Phe Asn Glu Cys Asp Glu
 435 440 445

Gly Leu Lys Ser Val Leu Ser Glu Ile Arg Leu Asn Leu Lys Thr Gly
 450 455 460

Lys Ser Thr Arg Lys Ser Ile Ile Glu Asn Pro Asp Glu Gln Val Asn
 465 470 475 480

Leu Glu Ala Gly Met Val Asn Arg Asn Lys Leu Gly Arg Lys Thr Glu
 485 490 495

Tyr Ala Tyr Leu Ala Ile Ala Glu Pro Trp Pro Lys Val Ser Gly Phe
 500 505 510

Ala Lys Val Asn Leu Phe Thr Gly Glu Val Glu Lys Phe Ile Tyr Gly
 515 520 525

Asp Asn Lys Tyr Gly Gly Glu Pro Leu Phe Leu Pro Arg Asp Pro Asn
 530 535 540

Ser Lys Glu Glu Asp Asp Gly Tyr Ile Leu Ala Phe Val His Asp Glu
 545 550 555 560

Lys Glu Trp Lys Ser Glu Leu Gln Ile Val Asn Ala Met Ser Leu Lys
 565 570 575

Leu Glu Ala Thr Val Lys Leu Pro Ser Arg Val Pro Tyr Gly Phe His
 580 585 590

Gly Thr Phe Ile Asn Ala Asn Asp Leu Ala Asn Gln Ala
 595 600 605

<210> 17

<211> 1617

<212> DNA

<213> Arabidopsis thaliana

<220>

<221> CDS

<222> (1)..(1614)

<400> 17

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 Met Ala Glu Lys Leu Ser Asp Gly Ser Ile Ile Ile Ser Val His Pro
 1 5 10 15

aga ccc tcc aag ggt ttc tcc tcg aag ctt ctc gat ctt ctc gag aga 96
 Arg Pro Ser Lys Gly Phe Ser Ser Lys Leu Leu Asp Leu Leu Glu Arg
 20 25 30

ctt gtc gtc aag ctc atg cac gat gct tct ctc cct ctc cac tac ctc 144
 Leu Val Val Lys Leu Met His Asp Ala Ser Leu Pro Leu His Tyr Leu
 35 40 45

tca ggc aac ttc gct ccc atc cgt gat gaa act cct ccc gtc aag gat Ser Gly Asn Phe Ala Pro Ile Arg Asp Glu Thr Pro Pro Val Lys Asp	192
50 55 60	
ctc ccc gtc cat gga ttt ctt ccc gaa tgc ttg aat ggt gaa ttt gtg Leu Pro Val His Gly Phe Leu Pro Glu Cys Leu Asn Gly Glu Phe Val	240
65 70 75 80	
agg gtt ggt cca aac ccc aag ttt gat gct gtc gct gga tat cac tgg Arg Val Gly Pro Asn Pro Lys Phe Asp Ala Val Ala Gly Tyr His Trp	288
85 90 95	
ttt gat gga gat ggg atg att cat ggg gta cgc atc aaa gat ggg aaa Phe Asp Gly Asp Gly Met Ile His Gly Val Arg Ile Lys Asp Gly Lys	336
100 105 110	
gct act tat gtt tct cga tat gtt aag aca tca cgt ctt aag cag gaa Ala Thr Tyr Val Ser Arg Tyr Val Lys Thr Ser Arg Leu Lys Gln Glu	384
115 120 125	
gag ttc ttc gga gct gcc aaa ttc atg aag att ggt gac ctt aag ggg Glu Phe Phe Gly Ala Ala Lys Phe Met Lys Ile Gly Asp Leu Lys Gly	432
130 135 140	
ttt ttc gga ttg cta atg gtc aat atc caa cag ctg aga acg aag ctc Phe Phe Gly Leu Leu Met Val Asn Ile Gln Gln Leu Arg Thr Lys Leu	480
145 150 155 160	
aaa ata ttg gac aac act tat gga aat gga act gcc aat aca gca ctc Lys Ile Leu Asp Asn Thr Tyr Gly Asn Gly Thr Ala Asn Thr Ala Leu	528
165 170 175	
gta tat cac cat gga aaa ctt cta gca tta cag gag gca gat aag ccg Val Tyr His His Gly Lys Leu Leu Ala Leu Gln Glu Ala Asp Lys Pro	576
180 185 190	
tac gtc atc aaa gtt ttg gaa gat gga gac ctg caa act ctt ggt ata Tyr Val Ile Lys Val Leu Glu Asp Gly Asp Leu Gln Thr Leu Gly Ile	624
195 200 205	
ata gat tat gac aag aga ttg acc cac tcc ttc act gct cac cca aaa Ile Asp Tyr Asp Lys Arg Leu Thr His Ser Phe Thr Ala His Pro Lys	672
210 215 220	
gtt gac ccg gtt acg ggt gaa atg ttt aca ttc ggc tat tcg cat acg Val Asp Pro Val Thr Gly Glu Met Phe Thr Phe Gly Tyr Ser His Thr	720
225 230 235 240	
cca cct tat ctc aca tac aga gtt atc tcg aaa gat ggc att atg cat Pro Pro Tyr Leu Thr Tyr Arg Val Ile Ser Lys Asp Gly Ile Met His	768
245 250 255	
gac cca gtc cca att act ata tca gag cct atc atg atg cat gat ttt Asp Pro Val Pro Ile Thr Ile Ser Glu Pro Ile Met Met His Asp Phe	816
260 265 270	

gct att act gag act tat gca atc ttc atg gat ctt cct atg cac ttc Ala Ile Thr Glu Thr Tyr Ala Ile Phe Met Asp Leu Pro Met His Phe 275 280 285	864
agg cca aag gaa atg gtg aaa gag aag aaa atg ata tac tca ttt gat Arg Pro Lys Glu Met Val Lys Glu Lys Lys Met Ile Tyr Ser Phe Asp 290 295 300	912
ccc aca aaa aag gct cgt ttt ggt gtt ctt ccg cgc tat gcc aag gat Pro Thr Lys Lys Ala Arg Phe Gly Val Leu Pro Arg Tyr Ala Lys Asp 305 310 315 320	960
gaa ctt atg att aga tgg ttt gag ctt ccc aac tgc ttt att ttc cac Glu Leu Met Ile Arg Trp Phe Glu Leu Pro Asn Cys Phe Ile Phe His 325 330 335	1008
aac gcc aat gct tgg gaa gaa gag gat gaa gtc gtc ctc atc act tgt Asn Ala Asn Ala Trp Glu Glu Asp Glu Val Val Leu Ile Thr Cys 340 345 350	1056
cgt ctt gag aat cca gat ctt gac atg gtc agt ggg aaa gtg aaa gaa Arg Leu Glu Asn Pro Asp Leu Asp Met Val Ser Gly Lys Val Lys Glu 355 360 365	1104
aaa ctc gaa aat ttt ggc aac gaa ctg tac gaa atg aga ttc aac atg Lys Leu Glu Asn Phe Gly Asn Glu Leu Tyr Glu Met Arg Phe Asn Met 370 375 380	1152
aaa acg ggc tca gct tct caa aaa aaa cta tcc gca tct gcg gtt gat Lys Thr Gly Ser Ala Ser Gln Lys Lys Leu Ser Ala Ser Ala Val Asp 385 390 395 400	1200
ttc ccc aga atc aat gag tgc tac acc gga aag aaa cag aga tac gta Phe Pro Arg Ile Asn Glu Cys Tyr Thr Gly Lys Lys Gln Arg Tyr Val 405 410 415	1248
tat gga aca att ctg gac agt atc gca aag gtt acc gga atc atc aag Tyr Gly Thr Ile Leu Asp Ser Ile Ala Lys Val Thr Gly Ile Ile Lys 420 425 430	1296
ttt gat ctg cat gca gaa gct gag aca ggg aaa aga atg ctg gaa gta Phe Asp Leu His Ala Glu Ala Glu Thr Gly Lys Arg Met Leu Glu Val 435 440 445	1344
gga ggt aat atc aaa gga ata tat gac ctg gga gaa ggc aga tat ggt Gly Gly Asn Ile Lys Gly Ile Tyr Asp Leu Gly Glu Gly Arg Tyr Gly 450 455 460	1392
tca gag gct atc tat gtt ccg cgt gag aca gca gaa gaa gac gac ggt Ser Glu Ala Ile Tyr Val Pro Arg Glu Thr Ala Glu Glu Asp Asp Gly 465 470 475 480	1440
tac ttg ata ttc ttt gtt cat gat gaa aac aca ggg aaa tca tgc gtg Tyr Leu Ile Phe Phe Val His Asp Glu Asn Thr Gly Lys Ser Cys Val 485 490 495	1488

act gtg ata gac gca aaa aca atg tcg gct gaa ccg gtg gca gtg gtg
 Thr Val Ile Asp Ala Lys Thr Met Ser Ala Glu Pro Val Ala Val Val
 500 505 510 1536

gag ctg ccg cac agg gtc cca tat ggc ttc cat gcc ttg ttt gtt aca
 Glu Leu Pro His Arg Val Pro Tyr Gly Phe His Ala Leu Phe Val Thr
 515 520 525 1584

gag gaa caa ctc cag gaa caa act ctt ata taa
 Glu Glu Gln Leu Gln Glu Gln Thr Leu Ile
 530 535 1617

<210> 18
 <211> 538
 <212> PRT
 <213> Arabidopsis thaliana

<400> 18
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Arg Pro Ser Lys Gly Phe Ser Ser Lys Leu Leu Asp Leu Leu Glu Arg
 20 25 30

Leu Val Val Lys Leu Met His Asp Ala Ser Leu Pro Leu His Tyr Leu
 35 40 45

Ser Gly Asn Phe Ala Pro Ile Arg Asp Glu Thr Pro Pro Val Lys Asp
 50 55 60

Leu Pro Val His Gly Phe Leu Pro Glu Cys Leu Asn Gly Glu Phe Val
 65 70 75 80

Arg Val Gly Pro Asn Pro Lys Phe Asp Ala Val Ala Gly Tyr His Trp
 85 90 95

Phe Asp Gly Asp Gly Met Ile His Gly Val Arg Ile Lys Asp Gly Lys
 100 105 110

Ala Thr Tyr Val Ser Arg Tyr Val Lys Thr Ser Arg Leu Lys Gln Glu
 115 120 125

Glu Phe Phe Gly Ala Ala Lys Phe Met Lys Ile Gly Asp Leu Lys Gly
 130 135 140

Phe Phe Gly Leu Leu Met Val Asn Ile Gln Gln Leu Arg Thr Lys Leu
 145 150 155 160

Lys Ile Leu Asp Asn Thr Tyr Gly Asn Gly Thr Ala Asn Thr Ala Leu
 165 170 175

Val Tyr His His Gly Lys Leu Leu Ala Leu Gln Glu Ala Asp Lys Pro
 180 185 190

Tyr Val Ile Lys Val Leu Glu Asp Gly Asp Leu Gln Thr Leu Gly Ile
 195 200 205

Ile Asp Tyr Asp Lys Arg Leu Thr His Ser Phe Thr Ala His Pro Lys
 210 215 220

Val Asp Pro Val Thr Gly Glu Met Phe Thr Phe Gly Tyr Ser His Thr
 225 230 235 240

Pro Pro Tyr Leu Thr Tyr Arg Val Ile Ser Lys Asp Gly Ile Met His
 245 250 255

Asp Pro Val Pro Ile Thr Ile Ser Glu Pro Ile Met Met His Asp Phe
 260 265 270

Ala Ile Thr Glu Thr Tyr Ala Ile Phe Met Asp Leu Pro Met His Phe
 275 280 285

Arg Pro Lys Glu Met Val Lys Glu Lys Lys Met Ile Tyr Ser Phe Asp
 290 295 300

Pro Thr Lys Lys Ala Arg Phe Gly Val Leu Pro Arg Tyr Ala Lys Asp
 305 310 315 320

Glu Leu Met Ile Arg Trp Phe Glu Leu Pro Asn Cys Phe Ile Phe His
 325 330 335

Asn Ala Asn Ala Trp Glu Glu Asp Glu Val Val Leu Ile Thr Cys
 340 345 350

Arg Leu Glu Asn Pro Asp Leu Asp Met Val Ser Gly Lys Val Lys Glu
 355 360 365

Lys Leu Glu Asn Phe Gly Asn Glu Leu Tyr Glu Met Arg Phe Asn Met
 370 375 380

Lys Thr Gly Ser Ala Ser Gln Lys Leu Ser Ala Ser Ala Val Asp
 385 390 395 400

Phe Pro Arg Ile Asn Glu Cys Tyr Thr Gly Lys Lys Gln Arg Tyr Val
 405 410 415

Tyr Gly Thr Ile Leu Asp Ser Ile Ala Lys Val Thr Gly Ile Ile Lys
 420 425 430

Phe Asp Leu His Ala Glu Ala Glu Thr Gly Lys Arg Met Leu Glu Val
 435 440 445

Gly Gly Asn Ile Lys Gly Ile Tyr Asp Leu Gly Glu Gly Arg Tyr Gly
 450 455 460

Ser Glu Ala Ile Tyr Val Pro Arg Glu Thr Ala Glu Glu Asp Asp Gly
 465 470 475 480

Tyr Leu Ile Phe Phe Val His Asp Glu Asn Thr Gly Lys Ser Cys Val
 485 490 495

Thr Val Ile Asp Ala Lys Thr Met Ser Ala Glu Pro Val Ala Val Val
 500 505 510

Glu Leu Pro His Arg Val Pro Tyr Gly Phe His Ala Leu Phe Val Thr
515 520 525

Glu Glu Gln Leu Gln Glu Gln Thr Leu Ile
530 535

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<210> 19
<211> 27
<212> DNA
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence: Primer

<400> 19
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<210> 20
<211> 31
<212> DNA
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence: Primer

<400> 20
attqqatcccc aaaagctaca cgctggtccc c 31

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<210> 21
<211> 38
<212> DNA
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence: Primer

<400> 21
atatatcttag aatgccttca tcagcttcaa acactttgg 38

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<210> 22
<211> 36
<212> DNA
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence: Primer

<400> 22
atataaggatc cctccggcac cggcgcgaaag ttccccg 36

<210> 23
<211> 29
<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 23
cccggtatcc ctcaaggcctc tctataccg 29

<210> 24
<211> 31
<212> DNA
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<220>

<223> Description of Artificial Sequence: Primer

<400> 24
cccggtatcc tttatacgga ttctgaggga g 31

<210> 25
<211> 33
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 25
attgaattca tggactctgt ttcttcttct tcc 33

<210> 26
<211> 34
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 26
attgaattct taaagcttat taaggtcact ttcc 34

<210> 27
<211> 35
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 27
aagaattcat ggccggagaaa ctcagtatgc gcagc 35

<210> 28		
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<223> Description of Artificial Sequence: Primer		
<400> 28		
aaaagaattc ggcttatata agagtttgtt cctgg		35
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<400> 29		
cgggatccat gcaacactct cttcgttctg atcttcttc		39
<210> 30		
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<210> 31		
<211> 32		
<212> DNA		
<213> Artificial Sequence		
<220>		
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<400> 31		
attgaattca tggcttcttt cacggcaacg gc		32
<210> 32		
<211> 17		
<212> DNA		
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<400> 32		
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<210> 33  
<211> 538  
<212> PRT  
<213> Arabidopsis thaliana
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 1 5 10 15
 Arg Pro Ser Lys Gly Phe Ser Ser Lys Leu Leu Asp Leu Leu Glu Arg
 20 25 30
 Leu Val Val Lys Leu Met His Asp Ala Ser Leu Pro Leu His Tyr Leu
 35 40 45
 Ser Gly Asn Phe Ala Pro Ile Arg Asp Glu Thr Pro Pro Val Lys Asp
 50 55 60
 Leu Pro Val His Gly Phe Leu Pro Glu Cys Leu Asn Gly Glu Phe Val
 65 70 75 80
 Arg Val Gly Pro Asn Pro Lys Phe Asp Ala Val Ala Gly Tyr His Trp
 85 90 95
 Phe Asp Gly Asp Gly Met Ile His Gly Val Arg Ile Lys Asp Gly Lys
 100 105 110
 Ala Thr Tyr Val Ser Arg Tyr Val Lys Thr Ser Arg Leu Lys Gln Glu
 115 120 125
 Glu Phe Phe Gly Ala Ala Lys Phe Met Lys Ile Gly Asp Leu Lys Gly
 130 135 140
 Phe Phe Gly Leu Leu Met Val Asn Val Gln Gln Leu Arg Thr Lys Leu
 145 150 155 160
 Lys Ile Leu Asp Asn Thr Tyr Gly Asn Gly Thr Ala Asn Thr Ala Leu
 165 170 175
 Val Tyr His His Gly Lys Leu Leu Ala Leu Gln Glu Ala Asp Lys Pro
 180 185 190
 Tyr Val Ile Lys Val Leu Glu Asp Gly Asp Leu Gln Thr Leu Gly Ile
 195 200 205
 Ile Asp Tyr Asp Lys Arg Leu Thr His Ser Phe Thr Ala His Pro Lys
 210 215 220
 Val Asp Pro Val Thr Gly Glu Met Phe Thr Phe Gly Tyr Ser His Thr
 225 230 235 240
 Pro Pro Tyr Leu Thr Tyr Arg Val Ile Ser Lys Asp Gly Ile Met His
 245 250 255
 Asp Pro Val Pro Ile Thr Ile Ser Glu Pro Ile Met Met His Asp Phe
 260 265 270

Ala Ile Thr Glu Thr Tyr Ala Ile Phe Met Asp Leu Pro Met His Phe
 275 280 285
 Arg Pro Lys Glu Met Val Lys Glu Lys Lys Met Ile Tyr Ser Phe Asp
 290 295 300
 Pro Thr Lys Lys Ala Arg Phe Gly Val Leu Pro Arg Tyr Ala Lys Asp
 305 310 315 320
 Glu Leu Met Ile Arg Trp Phe Glu Leu Pro Asn Cys Phe Ile Phe His
 325 330 335
 Asn Ala Asn Ala Trp Glu Glu Asp Glu Val Val Leu Ile Thr Cys
 340 345 350
 Arg Leu Glu Asn Pro Asp Leu Asp Met Val Ser Gly Lys Val Lys Glu
 355 360 365
 Lys Leu Glu Asn Phe Gly Asn Glu Leu Tyr Glu Met Arg Phe Asn Met
 370 375 380
 Lys Thr Gly Ser Ala Ser Gln Lys Lys Leu Ser Ala Ser Ala Val Asp
 385 390 395 400
 Phe Pro Arg Ile Asn Glu Cys Tyr Thr Gly Lys Lys Gln Arg Tyr Val
 405 410 415
 Tyr Gly Thr Ile Leu Asp Ser Ile Ala Lys Val Thr Gly Ile Ile Lys
 420 425 430
 Phe Asp Leu His Ala Glu Ala Glu Thr Gly Lys Arg Met Leu Glu Val
 435 440 445
 Gly Gly Asn Ile Lys Gly Ile Tyr Asp Leu Gly Glu Gly Arg Tyr Gly
 450 455 460
 Ser Glu Ala Ile Tyr Val Pro Arg Glu Thr Ala Glu Glu Asp Asp Gly
 465 470 475 480
 Tyr Leu Ile Phe Phe Val His Asp Glu Asn Thr Gly Lys Ser Cys Val
 485 490 495
 Thr Val Ile Asp Ala Lys Thr Met Ser Ala Glu Pro Val Ala Val Val
 500 505 510
 Glu Leu Pro His Arg Val Pro Tyr Gly Phe His Ala Leu Phe Val Thr
 515 520 525
 Glu Glu Gln Leu Gln Glu Gln Thr Leu Ile
 530 535